

Development of a 100 kWh/100 kW Flywheel Energy Storage Module

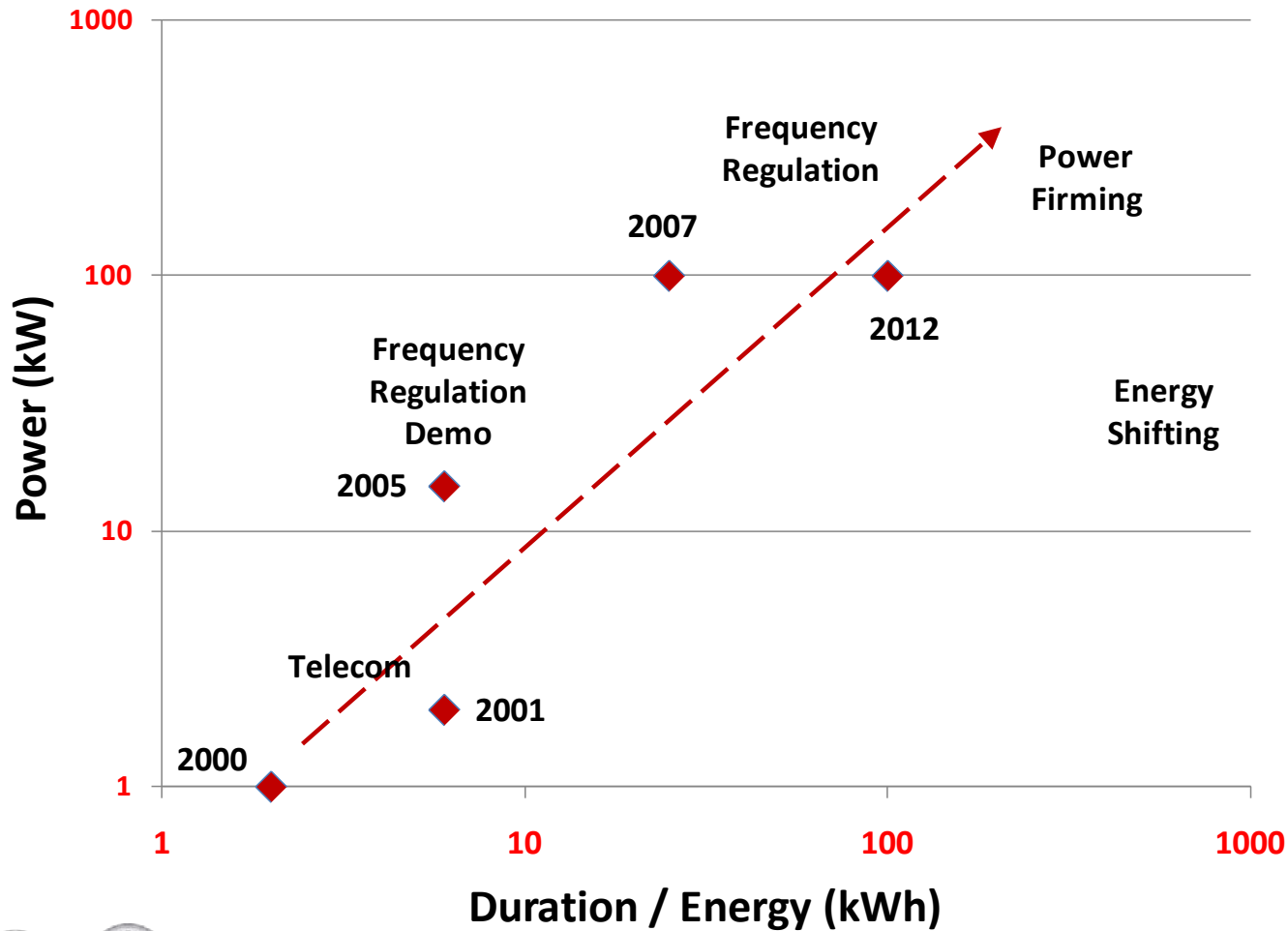
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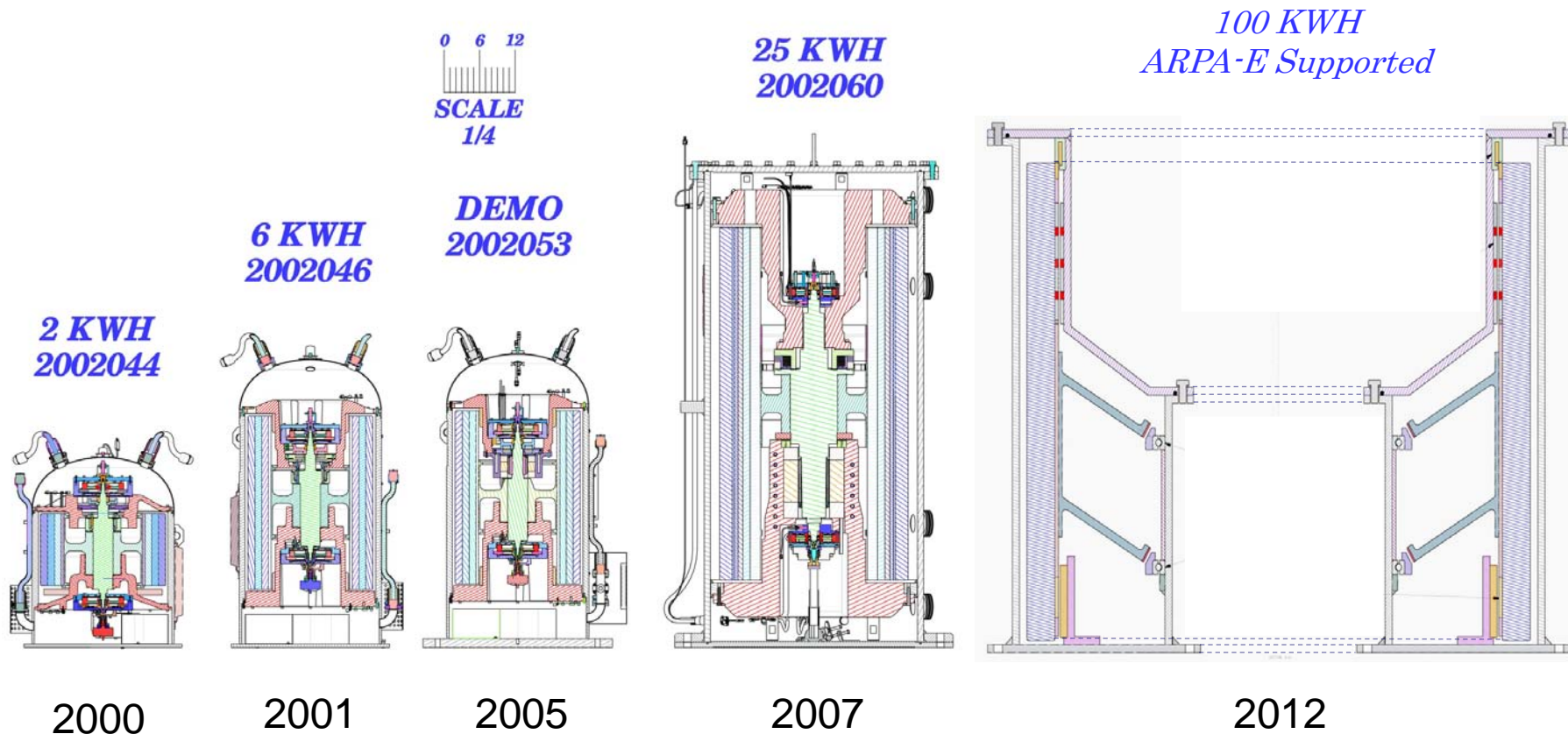
State of the art

Progression of Beacon Power flywheels



State of the art

Current Beacon flywheel suitable for Frequency Regulation



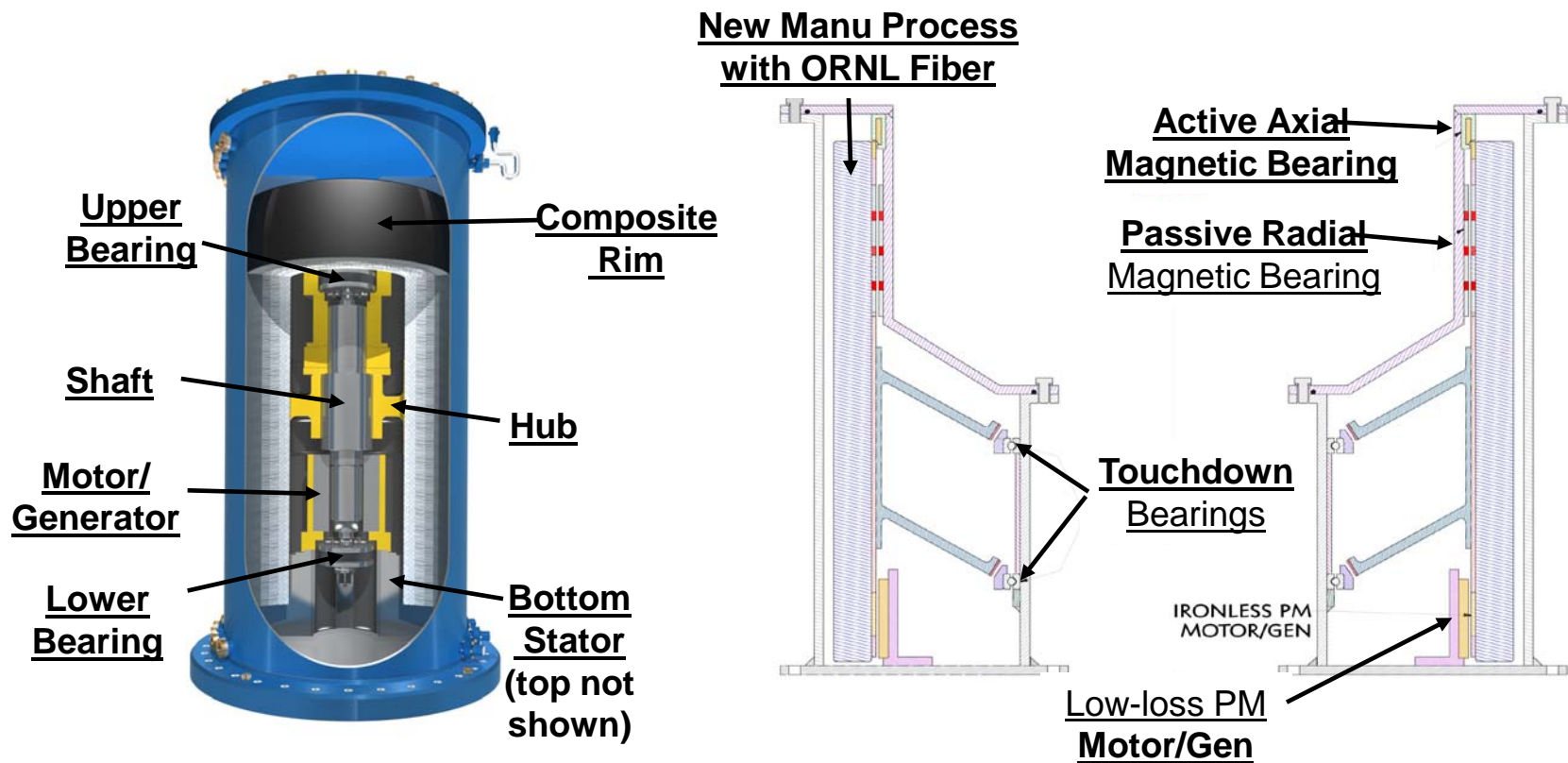
ARPA-E Goal

Low cost flywheel for renewable energy integration

Parameter	Gen4 Flywheel	ARPA-E Goal
Power	100 kW	100 kW
Time	15 minutes	1 hour
Available Energy	25 kWh	100 kWh
Cost	\$4.00/kWh	\$0.50/kWh
Idle Loss	4%/hour	0.2%/hour
Cycle Life	125,000	40,000

Technology

- Gen4 State-of-Art Flywheel to ARPA-E Transition
 - 2000 pound/25 kWh rim to 4000 pound/100 kWh rim (same height)



Challenges and Progress

- Flexible Magnets



- Improved Manufacturing



- Touch-down System



- Low Cost Carbon Fiber



Target Markets and Impact

Solar and Wind



Energy Surety and Fuel Savings



Target Markets and Impact

Wind/Diesel



Pseudo-inertia and Frequency Response

